CLAIMS

1. Sampling device characterised in that it comprises in a substrate (15), a wave guide core (17) capable of transporting a light wave E and an optical cladding (19), at least one portion of the cladding surrounding at least one portion of the core in a zone called the zone of interaction I, the said zone comprising among others a grating (21) capable of coupling in the cladding, a part of the light wave, the coupled part of the wave being called coupled wave (C), the refractive index of the cladding being different from the refractive index of the substrate and lower than the refractive index of the core at least in the part of the cladding next to the core in the zone of interaction.

2. Sampling device of claim 1, characterised in that the cladding of the device is optically connected to a first recovery and treatment element of all or part of the coupled wave (C).

3. Sampling device of any of claims 1 or 2, characterised in that the core of the device is optically connected to a second recovery and treatment element of all or part of the non coupled wave in the cladding (S).

4. Sampling device of any of claims 1 to 3, characterised in that after the zone of interaction (I) the core and cladding are spatially separate.

5. Sampling device of claim 1, characterised in that the cladding and the core of the device are optically connected to a same recovery and treatment element (50) comprising a set of optical elements (51).

6. Sampling device of any of claims 2 to 4, characterised in that the first recovery and treatment element of all or part of the coupled wave, comprises an optical element (33) directly positioned at one end of the cladding.

7. Sampling device of any of claims 2 to 4, characterised in that the first recovery and treatment element of all or part of the coupled wave, comprises a second zone of interaction (I') and an optical element (26), the second zone of interaction being formed in the substrate, for a second guide core (24) located in a portion of the cladding (19) and for a second grating (23) capable of coupling in the second core, the coupled wave (C) in the cladding, the said second core being optically connected to the optical element outside of this second zone of interaction.

8. Sampling device of claim 7, characterised in that the first and the second cores are decentred with respect to one other in the cladding and/or the cladding comprises a variation of section from one zone of interaction to the other.

9. Sampling device of any of claims 3 and onward, characterised in that the second recovery and treatment element comprises an optical element connected to the core of the device.

10. Sampling device of any of claims 5 to 9, characterised in that the optical element is a photo-detector or a group of photo detectors possibly associated to a formatting element.

11. Sampling device of any of claims 1 to 10, characterised in that the grating of a zone of interaction is formed in the guide core and/or in the cladding and/or in the substrate.

12. Sampling device applied to the creation of an optical amplifier, of any of claims 1 to 11, characterised in that it is optically connected to the output of an optical amplification element (45).

13. Sampling device of claim 12, characterised in that it is capable of acting as gain flattener at the output of the amplification element.

14. Sampling device applied to the creation of a linear filter of any of claims 1 to 12, characterised in that the zone of interaction conjointly performs filtering and sampling.

15. Fabrication method of an integrated optics sampling device of any of the previous claims,

characterised in that the one or more cores (17, 24) and the cladding (19) are created respectively for a modification of the refractive index of the substrate so as that at least in the part of the cladding next to the core and that at least in the corresponding zone of interaction (I,I'), the refractive index of the cladding is different from the refractive index of the substrate and lower than the refractive index of the core and in that the corresponding grating (21, 23) is created by a modification of the effective index of the substrate.

16. Fabrication method according to claim 15, characterised in that the modification of the refractive index of the substrate is obtained by radiation and/or by introduction of ionic species.

17. Fabrication method of claim 16, characterised in that it comprises the following steps:

- a) introduction of a first ionic species in the substrate so as to permit the optical cladding to be obtained after step c),
- b) introduction of a second ionic species in the substrate so as to permit the guide core(s) to be obtained after step c),
- c) burying of the ions introduced in steps a) and b) so as to obtain the cladding and guide core(s),
- d) formation of the one or more gratings.

18. Fabrication method of claim 17, characterised in that the introduction of the first and/or second

ionic species is carried out by an ionic exchange or by ionic implantation.

19. Fabrication method of claim 17 or 18, characterised in that the substrate is made of glass and contains Na+ ions, the first and the second ionic species are Ag+ and/or K+ ions.

20. Fabrication method of any of claims 17 to 19, characterised in that step a) comprises the creation of a first mask (71) comprising a pattern capable of obtaining the cladding, the first ionic species being introduced through this first mask and step b) comprises the elimination of the first mask and the creation of a second mask (75) comprising a pattern capable of obtaining the core(s), the second ionic species being introduced through this second mask.

21. Fabrication method of any of claims 15 to 20, characterised in that the grating(s) are obtained by introduction of ionic species through a mask permitting the core(s) and/or cladding to be obtained or by a specific mask.

22. Fabrication method of any of claims 15 to 20, characterised in that the grating(s) are obtained by localised heating.

23. Fabrication method of any of claims 15 to 20, characterised in that the grating(s) are obtained by

etching of the substrate next to the corresponding zone of interaction.

24. Fabrication method of any of claims 17 to 23, characterised in that the first ionic species is buried at least partially before step b) and the first and second ionic species are buried after step b).

25. Fabrication method of any of claims 17 to 24, characterised in that the first ionic species and the second ionic species are buried after step b).

26. Fabrication method of any of claims 17 to 25, characterised in that at least part of the burying takes place with the application of an electrical field.

27. Fabrication method of any of claims 17 to 26, characterised in that at least part of the burying takes place by re-diffusion in an ionic bath.

28. Fabrication method of any of claims 17 to 27, characterised in that all or part of the burying takes place by depositing at least one layer (78) on the surface of the substrate.

29. Fabrication method of any of claims 17 to 28, characterised in that the first ionic species and/or the second ionic species are introduced with the application of an electrical field.